

You are my density!

STANDARD 3200-02 Students will compare and contrast the structure of Earth's crust and interior.

OBJECTIVE 3200-0201 Construct and defend a model of Earth's crust and interior.

Explain how density affects the organization of materials that make up Earth's crust and interior.

Intended Learning Outcomes:

- 1a. Make observations and measurements.
- 1d. Make predictions based on observations.
- 2g. Construct models to describe natural phenomena.
- 5c. Understand science concepts and principles

Background:

The students should be familiar with the layers of the earth and how the density of the earth's layers is thought to increase with depth.

Materials:

Teacher Materials:

- o 4 large containers - Large soda bottles, milk jugs, glassware, etc
- o Food coloring (yellow, blue, red, and green)
- o Salt or Sugar

Student Materials:

- o 1 spoon for each group
- o 4 small containers for each group - test tubes, beakers, or clear plastic cups
- o 1 small container for each group to be used for waste after each trial
- o Clear straw
- o Ruler



Teacher Preparation:

Fill 4 large containers with water. Color each container of water a different color. The greater the color intensity the better.

Student Procedure:

1. Each group of students will receive a straw, a spoon, a ruler, and a total of five small containers. Four of the containers to be filled with colored solution and one to be used as waste.
2. Using the ruler, the students will mark the straw from the bottom up every centimeter for about 4 cm.
3. The students will fill four small containers 2/3 full with a different color in each container.

Instruct students to :

- o add one level spoonful of salt or sugar to the yellow solution
- o add two level spoonfuls of salt or sugar to the blue solution
- o add three level spoonfuls of salt or sugar to the red solution
- o add nothing to the green solution

Stir each container well to make a solution

4. Place the straw into the one of the colored solutions to a depth of 1 cm. Seal the top with your finger and then remove the straw.
5. Keep your finger on the straw and put it into a different solution to a depth of 2 cm. Take your finger off the straw while the straw is in the solution and then seal the straw by replacing your finger on the end of the straw. Lift the straw out of the solution. Record your observations either as a drawing or on a chart. Empty the straw into the waste container.
6. Repeat step 5 using different solutions. Record your observations. How does the solution form layers? Can you create three layers? Can you make four layers?
7. Compare your results. Draw a picture of the solutions with the greatest density on the bottom and the least density on top. Now draw a picture of the interior of the earth. Using the same colors from the solutions to match the layers of the earth.
8. Now write an essay comparing the activity to the layers of the earth

Drag your mouse over the link to watch a [565KB quicktime movie of how you are to combine two of the liquids.](#)

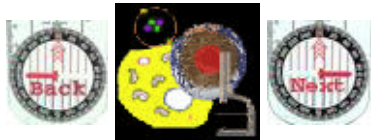


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Safety concerns:



Be sure to keep all chemical and glassware safety rules. Remember to never taste or drink any solutions. As with all science lab activities, the most important safety rule is to [follow all teacher directions](#).



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